# Shamak Dutta

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https://shamak.github.io/

## Research Interests

My research interests lie in machine learning and its related fields. I am excited about recent advances in generative models and deep learning.

## Education

**University of Waterloo** — **Waterloo, Ontario, Canada**
*Candidate for Bachelors of Computer Engineering, Honours* — *September 2012 - present*

## Publications

H. Tizhoosh, C. Mitcheltree, S. Zhu, and **S. Dutta**. *Barcodes for Medical Image Retrieval Using Autoencoded Radon Transform*. In International Conference on Pattern Recognition (ICPR), 2016.

## Research Experience

**Undergraduate Researcher, Deep Learning for Motion Analysis** — **Waterloo, Ontario, Canada**
*Supervisor: Dana Kulić, Adaptive Systems Lab, University of Waterloo* — *May 2016 - August 2016*

- Analyzed deep recurrent neural networks to model human motion for forecasting & labeling
- Wrote a paper on my results and experiments which received an A grade

**Undergraduate Researcher, Applied Combinatorial Optimization** — **Waterloo, Ontario, Canada**
*Supervisor: Stephen Smith, University of Waterloo* — *May 2016 - August 2016*

- Implemented a solver using heuristics based on adaptive neighbourhood search for the Generalized Travelling Salesman Problem with overlapping sets

**Undergraduate Researcher, Deep Learning for Image Retrieval** — **Waterloo, Ontario, Canada**
*Supervisor: H. Tizhoosh, KIMIA Lab, University of Waterloo* — *September 2015 - December 2015*

- Co-authored a paper on deep autoencoders trained on Radon transforms for content-based image retrieval, accepted at International Conference on Pattern Recognition (ICPR), 2016
- Researched opposition-based learning to accelerate learning convergence of neural networks

## Work Experience

**A9** — **Palo Alto, California, USA**
*Software Engineer Intern, Amazon Search* — *September 2016 - December 2016*

- Built a deep neural model to generate semantic word embeddings to calculate relevancy, understand synonyms and improve ranking for results in Amazon search
- Introduced a deep neural model to rank products on Amazon, given the information about the search query and associated products, achieving significant accuracy
- Gave a talk to 30 people on implementing a character-level language model, using recurrent neural networks, in TensorFlow

**A9** — **Palo Alto, California, USA**
*Software Engineer Intern, Amazon Advertising* — *January 2016 - April 2016*

- Modified an open source distributed search engine, Elasticsearch, to return 1 million document field values in 100ms which gave a 200x speed improvement from the default implementation
- **Excellent** end-of-term evaluation.

**Lookout** **San Francisco, California, USA**
*Software Engineer Intern, Security & Infrastructure* *May 2015 - August 2015*

- Developed a search parser to convert structured natural text into an Elasticsearch query
- Won a hackathon by developing a scoring algorithm to gamify code reviews with points and leaderboards: processed thousands of code reviews & displayed several insightful metrics
- Built multiple features into the internal security analysis platform used by research teams
- **Excellent** end-of-term evaluation.

**Avvasi** **Waterloo, Ontario, Canada**
*Software Engineer Intern, Core Platform* *September 2014 - December 2014*

- Built & shipped a network testing framework for high performant computer blades with a heavy emphasis on concurrency and parallelization, ultimately automating production workflow
- **Excellent** end-of-term evaluation.

**Achievers** **Toronto, Ontario, Canada**
*Software Engineer Intern, Infrastructure* *January 2014 - April 2014*

- Built several software tools in PHP increasing overall productivity for the development team
- Developed an application to visualize important asteroid information at a NASA Hackathon
- Actively participated in the local tech community in hosting tech talks
- **Outstanding** end-of-term evaluation.

**pVelocity** **Toronto, Ontario, Canada**
*Software Engineer Intern, Quality Assurance* *May 2013 - August 2013*

- Developed scripts to automate builds and testing workflow for mobile and desktop applications
- **Outstanding** end-of-term evaluation.

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## Honors & Awards

- Engineering International Student Scholarship, University of Waterloo, 2012
- President's Scholarship of Distinction, University of Waterloo, 2012
- President's Research Award, University of Waterloo, 2015

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## Relevant Coursework

**ML:** Cooperative & Adaptive Algorithms, Machine Learning (Coursera), Deep Learning (Udacity)

**Math:** Discrete Math, Multivariate Calculus, Linear Algebra, Probability Theory & Statistics

**Algorithms & Control:** Robot Dynamics & Control, Operating Systems Programming, Analog Control, Computer Networks, Digital Hardware Systems, Compilers, Embedded Microprocessor Systems

**Signal Processing:** Signals & Systems, Analog & Digital Communications

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## Technical Skills

**Languages:** Python, Java, Ruby, C++

**Software:** TensorFlow, Theano, Julia, Hadoop, Matlab, R